

**The Working Group on Risk, with the support of the group BFA (SFdS) & Institut des Actuaire (IA), has the pleasure to invite you to the Seminar by:**

**Prof. Abderrahim TAAMOUTI**  
Universidad Carlos III de Madrid (Spain)

**Wednesday, March 19, 2014 at 12:30 pm**  
**EEE - ESSEC La Défense – room 102**

**Maps Measuring Nonlinear Granger Causality in Mean**

We propose model-free measures for Granger causality-in-mean. Unlike the existing measures, ours are able to detect and quantify nonlinear Granger causality-in-mean between random variables. The new measures are based on nonparametric regressions and defined as a logarithmic function of restricted and unrestricted mean square forecast errors. They are easily and consistently estimated by replacing the unknown mean square forecast errors by their nonparametric kernel estimates. We establish the asymptotic normality of the nonparametric estimator of causality measures, which we use to build tests for their statistical significance. A desirable property of those tests is that they have nontrivial power against square-root-T-local alternatives, where T is the sample size. Monte Carlo simulations reveal that the tests behave very well and have good finite sample size and power properties for a variety of typical data generating processes and different sample sizes. Moreover, since testing that the value of the measure is equal to zero is equivalent to testing for non-causality-in-mean, we consider an additional simulation exercise to compare the empirical size and power of our tests with those of nonparametric test of Granger causality-in-mean proposed by Nishiyama et al. (2011). Simulation results indicate that our tests have comparable size, but better power than Nishiyama et al. (2011)'s test. We also establish the validity of smoothed local bootstrap that one can use in finite sample settings to perform statistical tests. Finally, the empirical importance of measuring nonlinear causality-in-mean is also illustrated. We quantify the degree of nonlinear predictability of equity risk premium using variance risk premium. Our empirical results show that the variance risk premium is a very good predictor of equity risk premium at horizons less than six months. We find that there is a high degree of predictability at horizon one-month which can be attributed to a nonlinear causal effect.



**YOU HAVE THE ANSWER**

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<http://crear.essec.edu/working-group-on-risk/meeting-schedule-2013-2014>

# Prof. Abderrahim TAAMOUTI

## Universidad Carlos III de Madrid (Spain)

**Abderrahim TAAMOUTI** (PhD in Economics, University of Montreal) is Associate Professor at Univ. Carlos III, Madrid. His fields of specialization are Econometrics and Finance. He mainly works on Granger causality analysis, hypothesis testing, asset pricing, portfolio selection, and risk management. He published in many international journals as Journal of Econometrics, Review of Finance, Journal of Multivariate Analysis, Journal of Business & Economic Statistics, Journal of Empirical Finance, and Journal of Financial Econometrics.

